Wetlands and Well-being: Getting more out of South Africa's wetlands

An Introductory Handbook for the
Water Research Commission

by

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Preface

This handbook is a product of a research project entitled: *Wetlands in South Africa: their contribution to well-being*, commissioned by the Water Research Commission and led by Duncan Hay and Associates. The work was conducted in association with colleagues at AWARD, the Inina Craft Agency, the University of KwaZulu-Natal and WWF Mondi Wetlands Programme.

The focus here is on freshwater inland wetlands but the lessons are derived from and could equally be applied to other aquatic systems, particularly rivers, dams, lakes, estuaries and our coastline.

So as to provide an easily read narrative literature is not cited in the text but the main sources of information used in compiling this handbook are detailed in Appendix 1 and briefly summarised. Also, all those that are open access resources are included in the CD that accompanies the handbook.

The decision support system developed as part of this project, the project's final technical report and a series of case-studies are also contained on the CD.

Some practical definitions

Adaptive management is an iterative process of: action, reflecting on the action, learning and refining the action. It takes on board the complexity and uncertainty associated with natural resource management by probing, testing, experimenting and continual learning.

Benefits (in this context) are what ecosystem services provide and which contribute to our well-being.

Community-Based Natural Resource Management (CBNRM) is about local people taking responsibility for and being accountable for the governance and management of natural resources at a local level.

In CBNRM local people, usually the users of a resource, take responsibility for its management (Amy Panikowski)

Common pool resources are those from which it is difficult to exclude potential users and where use of the resources by a potential user reduces availability for other users. Many water resources are common pool resources.

A common property regime is where a group, or several groups of people, govern a defined resource (property), creating rules of use and excluding those who do not have rights. Common pool resources are regularly governed through a common property regime.

Complexity is used to describe something that has many parts that are intricately arranged. What is important and separates it from something that is complicated is that the arrangements are so intricate that the outcomes of the interactions are uncertain and unpredictable. Ecosystems and social-ecological systems are typically complex.

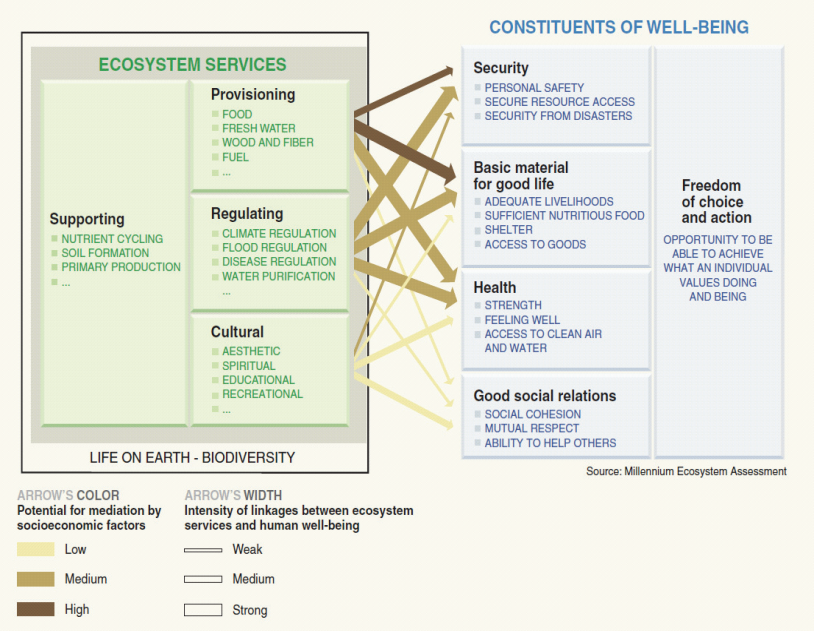
Ecosystem services are the aspects of ecosystems that are used by people and contribute to human well-being.

Governance is ultimately about who decides what and how the decisions are made. Governance encompasses policies, institutions, processes and power.

Institutions are the rules and norms used by individuals to determine the 'may, must, and must not' of any situation. While some of these rules are formal, such as legislation, many rules-in-use lack any formal status. Marriage is an institution that has both formal and informal rules.

Livelihood is the means of securing what we need to live – food, money, shelter, safety, education, connectedness.

Millennium Ecosystem Assessment (MA) Framework provides a sound and well-established framework for the assessment of ecosystem services and the benefits to human well-being. The MA established the concept of ecosystem services as an essential model for linking the functioning of ecosystems to human wellbeing.



The Millennium Ecosystem Assessment framework[1]

[1] Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: wetlands and water synthesis. World Resources Institute, Washington, DC.

Participatory Rural Appraisal is a methodology which allows local people to learn together, to conduct their own analyses and to plan and act together.

Property rights are the rights that people have to access a particular resource, and the responsibilities that come with these rights. The resource might be something tangible like land, or something intangible like an idea (intellectual property). We regularly read of a 'bundle of rights'. This recognises that people have different rights to resources.

Type of Right	Who is the owner?	An example	Who controls access?	Who is the manager?
Public	State	National Park	State	State
Private	Private	Freehold land	Individual owner	Individual owner
Common	Group	Common land	Joint owners	Joint owners
Open access	No-one	Open ocean fishery	Uncontrolled	None

Different types of property rights

Public infrastructure is both physical infrastructure such as roads and water pipes, and the rules and conventions (institutions) which help us or prevent us from accessing a particular resource. Public infrastructure providers are the organisations or people who build the roads or who set the rules and conventions.

Resilience is the ability of a system to return to normal or 'bounce back' following some form of stress.

Social-ecological system is a linked system of people and nature.

Well-being is quality of life.

Chapter 1: Introduction

"…..the challenge still remains of developing an approach that integrates environmental and socio-economic development perspectives to ensure sustainable wetland use."[2]

Some context

When we fly in to OR Tambo International Airport from the south, the clouds part and the land emerges as we descend. At first we observe a patchwork of cultivated fields, then, as we close in on the runway, it changes to a jumble of old mine dumps, houses, golf courses, highways and factories. The only portions of land that are not completely transformed are the wetlands and watercourses. Many people might find this horrifying but, in some bizarre way, it is curiously reassuring – there are still some areas of green, fairly natural space!

[2] Wood A, Dixon A and McCartney M. 2013. People-centred wetland management. Chapter 1 in Wood A, Dixon A and McCartney M. 2013 (Editors). *Wetland management and sustainable livelihoods in Africa*. Routledge. ISBN13: 978-1-84971-412-9. Pp 21–22.

Wetlands and watercourses are often the only remaining 'greenspace' (Donovan Kotze)

But the realisation then dawns that, because the natural landscape outside the wetland has been transformed, it is no longer doing the work it once did. It no longer protects and covers the soil, takes up surplus nutrients, sustains biodiversity and slows water flow. This job is now being done largely by the remaining wetland and watercourse systems. So, as we continue to transform other landscapes, our wetland systems have to work harder and they become relatively more important in securing our supply of good quality water. This holds true for large portions of South Africa. Since water is not abundant, and given our

development trajectory, it is certain that one of the greatest contributions wetlands will make towards our well-being in the future is in helping us secure our water supply.

It is useful to combine this assertion with the results of some ground-breaking research recently conducted on rural household economies in South Africa. It comprised a survey of 1 743 households in KwaZulu-Natal, Limpopo and the Eastern Cape. Where do most of these households get their food? At a supermarket, where else! Only 10–20% purchased their food from local or informal markets, so most are not even buying locally. Only 2% of these households indicated that agriculture was their main source of income. For most (60%), wages constituted the main source of income followed by grants (30%). Only one quarter of households relied on home-grown maize and fruit to contribute to their food. This research has firmly exploded the myth of a rural, agriculturally-based, subsistence economy in South Africa. The rural economy is increasingly based on cash, wages and social welfare, with less direct reliance on the natural-resource base.

However, the assertion and the results of the research do not mean that wetlands are not contributing significantly and directly to the well-being of people living at or near them. Research at Mbongolwane in KwaZulu-Natal, Craigieburn in Mpumalanga, at Papenkuils in the Western Cape and on Mondi forestry land illustrates quite graphically that certain individuals, groups and communities still share a very intimate relationship with wetlands and the benefits which

they supply. And it is often to the poor and the marginalised that these benefits accrue – the wetland is a survival safety net. But, it is not just about money and survival; many of the bonds are rooted in long-standing customs and conventions.

uMngeni Vlei performs a critical water security role in the catchment (Duncan Hay)

So, in the context of a conversation on wetlands and well-being, what can we take from all this? It is clear from observations at many wetlands in South Africa that direct subsistence use of wetland resources is decreasing. Fewer people are drawing water directly from the wetland, cultivating crops in the wetland, grazing and watering livestock and harvesting fibre from it. What is increasing is the indirect contribution to our well-being – primarily

securing water resources. This dynamic change has massive implications for governance and management as those who govern are changing and those who use and/or are affected by use are also changing. The primary user is shifting from a rural farmer to a water utility company and an urban resident.

What is the purpose of the handbook?

There is a rich and growing body of research and experience that links our well-being to the natural resources that surround us, and this is particularly true for our water resources of which wetlands form an important part. We all accept that our survival and our well-being are dependent on the decisions we make about how we use and share these natural resources. So, the overall purpose of this handbook is to take the theory, the research and the experience and translate it into something that is accessible; something that guides practitioners, policy makers and stakeholders towards better decisions – so that we can serve wetlands better and, in turn, wetlands can serve us better.

This handbook and its associated decision support system are designed to assist anyone who is part of a management process or part of supporting a management process at a wetland or wetlands in South Africa, where a particular focus is the contribution to human well-being.

- It provides a general context relating how history has brought us to the present, and summarising the key findings of research conducted over the last fifteen years. (Chapter 2)
- It provides a user's perspective on wetlands and well-being focusing on practical examples of how we might get more out of wetlands. (Chapter 3)
- It describes the main attributes of a wetland social-ecological system. (Chapter 4)
- It explains an adaptive process to facilitate local-level wetland management and the key principles informing this process. In engaging this process it lists the key questions that participants should ask and answer to improve overall understanding of the system and its dynamics. (Chapter 5)
- It provides a brief summary of the decision support system (Chapter 6), the details of which are contained in the accompanying CD.
- It provides some concluding thoughts on how the relationship between people and wetlands might evolve to the benefit of both. (Chapter 7)
- It provides a guide to detailed literature and resource material that might be useful for specific applications. (Appendix 1)

Chapter 2: Some history and past research

"That men do not learn very much from the lessons of history is the most important of all the lessons of history." Aldous Huxley

Some history

Humans have long enjoyed a close association with wetlands. This association has not always been beneficial to both parties; it has quite often been conflictual and contradictory. While providing fertile soils for crop production, wetlands are, at the same time, sources of disease; while providing reeds for building, harvesters are at risk from drowning or being eaten by lurking crocodiles.

Understanding how our relationship with wetlands has evolved over time is important because it provides us with the context for where we find ourselves now. It also establishes the trajectory of where this relationship might be going. If we know the trajectory we can then influence its direction.

We can conveniently divide the history of wetland use and management in South Africa into four eras. The first might be termed the pre-colonial era where the human population was low and activities at or around wetlands would have

been limited, but still important. At a wetland, local residents would have grazed livestock in the dry season, cultivated small patches, hunted game, collected water for bathing and drinking, mined clay to plaster homestead walls and manufacture pots, used sedges and reeds for thatching and bedding, harvested medicinal plants, and observed numerous customary and spiritual practices. Homesteads would have been set back from floodplains and the wetlands they contain; an obvious risk avoidance strategy to cope with flooding, large and dangerous wildlife and various diseases such as malaria. Although this type of relationship with wetlands is disappearing, it still persists in some rural areas in South Africa. The primary difference now is that interaction between people and wildlife has declined. Large game is mostly confined to game reserves and humans no longer inhabit these areas.

The second era might be termed the industrial/colonial era where wildlife (elephant, hippo, rhino, buffalo and large antelope) that helped shape wetland processes were decimated through hunting; where wetlands were perceived as sources of disease and hazard; where extensive drainage took place to facilitate agricultural production; and where mining and urban development caused significant additional wetland loss. It was during this pioneering era that we saw our greatest loss of wetland habitat. In South Africa it has been estimated that almost half our wetland area was lost during this period.

The third era might be termed the RAMSAR era where, as a response to wetland destruction and decline, the focus moved to protection and conservation. This was well documented in the USA where, since 1974, policy and regulatory reform has moved wetlands to a 'no net loss' situation. More recently this has moved still further and in 2004 the US Federal Government indicated its intention to restore, reclaim and protect an additional three million acres of wetland over the next five years.

This change of attitude is also reflected in current policy, legislation and regulation related to wetland use in South Africa. A brief scan delivers a very clear and unambiguous protectionist message – keep out, wetlands are sacred places!

We are still grappling with the impacts of mining, industrial development, and large scale commercial agriculture and forestry on our wetlands, but we are moving into an era of 'wise use' or 'people-centred wetland management'. There are four key issues that we are currently grappling with:

- Firstly, we are attempting to make a paradigm shift from thinking of a wetland purely as an ecological system to thinking of a wetland as a system comprising dynamic interactions between people and the biophysical environment. People are an integral part of, and not separate from, the system. This has immediate implications when we consider the boundaries and attributes of the system – it is

much larger and it is much more complex than we first imagined.

- Secondly, we recognise that wetlands are suppliers of key services that support our well-being and that we need to manage wetlands in order to ensure that the flow of benefits continues. But, as competition for these benefits grows, how do we allocate them in a manner that is fair and sustainable?
- Thirdly, we increasingly recognise that the wetland manager is not an official sitting in an office in Polokwane or Pietermaritzburg. He or she is the wetland user whose daily activities affect the wetland. After a long period of exclusion how do we support the 'real managers' in exercising both their rights and responsibilities, and realising improved benefits?
- The fourth point, which is linked closely to the third, is that we have significant technical knowledge about wetland conservation and management. But we have tended to ignore local knowledge residing with the 'real managers'. *"Identifying local knowledge is not so much a quest for 'fact' but rather an attempt to understand the meaning and significance that local people place on their environment…"*[3] There is a

[3] Wood A, Dixon A and McCartney M. 2013. Conclusions. Chapter 11. In Wood A, Dixon A and McCartney M. 2013 (Editors). *Wetland management and sustainable livelihoods in Africa*. Routledge. ISBN13: 978-1-84971-412-9. p 262.

great need to understand local knowledge and appreciate its value.

It is likely that the main attributes and challenges of the current era are likely to be with us for some time and take us into the future. The steady convergence of conservation and development paradigms is likely to continue, as is the principle of 'governing with the people' rather than 'governing for the people'. In a South African context, what is articulated in policy but has yet to materialise in practice in a substantive way, is restitution – the restitution of customary and traditional rights to wetland resources. At Mbongolwane in rural KZN, we see that individuals and groups are cultivating amadumbe (taro) in the wetland, but they are doing so without any formally secured rights. Technically, the amadumbe cultivators are in contravention of numerous statutory regulations. Historical rights associated with these kinds of livelihood-based activities require restitution. At Umlalazi and in the Isimangiliso Wetland Park, rights to harvest reeds and sedges have been partially restored but the authority remains ultimately with the state conservation agency. Full restoration of rights will occur when the harvesters are fully involved in allocating the rights.

While people-centred wetland management is likely to be around for a while, we are seeing massive and rapid changes in patterns of use in and around wetlands, in many areas of South Africa. We have already mentioned these changes in the introduction but to explain further: in wetlands the harvesting of sedges and reeds for craft and construction is

declining; in and around wetlands small-scale agricultural production is diminishing and large scale commercial production is taking hold. Mining, particularly of coal, is threatening numerous valuable wetland systems.

Coal mining, particularly in the Mpumalanga Highveld, impacts on numerous wetland systems (Angus Burns)

Formal and informal development is encroaching on wetland areas that are close to urban centres, bringing with it increased run-off rates and various forms of pollution. In both urban and rural settings alien invasive plants compromise wetland functioning. While direct consumptive use of wetlands is decreasing in many areas there is an

increase in non-consumptive use. With a growing and materially developing citizenry we need more high quality water for domestic, agricultural and industrial use. A wetland contributes to this supply. Also, several wetland systems are contributing significantly to our tourism product and, with this, to economic opportunities and jobs.

Key findings from recent research

Over the past fifteen years there has been significant research aimed at improving our understanding of the relationship between people and wetlands. The focus in Africa has been on wetlands as a source of livelihoods and poverty reduction with a particular focus on agricultural use. We summarise some of this research in more detail in Chapter 6 but here are the key findings:

1. The range and value of benefits that we derive from wetlands are far greater than what is initially apparent. Many authors have tabulated these benefits. An example, from the research of Jane Turpie, is tabulated in Table 2.1.
2. Wetlands vary in the range of benefits and the value of the benefits they deliver to us. Some wetlands provide very little while others are critical to the survival of many people.

3. Generally, the overall use of wetlands is increasing as is the relative importance of wetlands as a source of water security.
4. There is a steady convergence of the conservation and development agendas as they relate to wetland governance and management. Both conservation and development agencies recognise increasingly that wetlands need to realise their development potential but that, in order to this, they need to be conserved.
5. There is considerable potential to increase and diversify the services and resultant benefits that we derive from wetlands, particularly in the areas of tourism, recreation and selective crop production.
6. The governance and management of common pool natural resources needs to be devolved as far as possible to the local level – a community-based natural resource management (CBNRM) approach is required. To quote the doyen of CBNRM in southern Africa, Marshall Murphree, "*It is the only viable option for an effective human stewardship of most of Africa's landscapes*."[4]
7. Wetlands are increasingly defined as social-ecological systems rather than as simply ecological systems. This broader definition recognises that humans are

[4] Murphree M. 2009. The strategic pillars of communal natural resource management: benefit, empowerment and conservation. *Biodiversity and Conservation. 18 (10).*

inextricably a part of, and not separate from, the wetland system.

8. It is increasingly recognised that in the management of natural resources there are high levels of complexity and uncertainty. An adaptive process that emphasises continual and collective learning is required. Inherent in this is building the capacity to manage.
9. Increasingly emphasised is that every wetland social-ecological system is unique and that, in order to engage in governance or management (or support of these processes), we need to have a good understanding of the particular context in which it occurs, and its dynamics.
10. Wetlands as social-ecological systems are inextricably linked with the broader social and ecological landscape and so both governance and management need to be conducted within this broader context.
11. Climate change predictions indicate that some areas will get wetter and others dryer and, in all areas, weather events will become more extreme. So wetlands, wherever they are located, will become increasingly important in ameliorating extreme events and reducing the risks associated with both droughts and floods.
12. Through history many individuals, groups and communities have been marginalised and deprived of their rights to wetland resources. It is increasingly

recognised that these rights need to be restored. This is particularly true for rural women.

13. The Working for Wetlands Programme has demonstrated that wetland rehabilitation is a valuable generator of jobs, income and well-being.

The Working for Wetlands Programme is a valuable source of employment and income (Pontso Pakkies)

Table 2.1: Types of services supplied by inland wetlands[5]

Types of Services		Description
Provisioning services	Water	Provision of water for livestock or domestic use
	Food, medicines	Production of wild foods and medicines
	Grazing	Production of grazing for livestock
	Raw materials	Production of fuel, craftwork materials, construction materials
	Genetic resources	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests, ornamental species
Regulating services	Climate regulation	Carbon sequestration; wetlands are believed by some to be carbon sinks that contribute towards reducing carbon emissions, but the opposite may in fact be true
	Flow regulation	Flood attenuation; reduction of the amplitude and velocity of flood waters by wetlands, reducing downstream damage
		Groundwater recharge; wetlands are commonly thought to provide differential recharge to groundwater relative to surrounding vegetation types, and to contribute to dry season base flows
	Sediment retention	Retention of soil and fertility within an ecosystem
	Waste treatment	Breaking down of waste, detoxifying pollution; dilution and transport of pollutants
	Regulation of pests and pathogens	Change in ecosystem health affects the abundance or prevalence of malaria, bilharzia, liver fluke, black fly, invasive plants, etc.
	Refugia	Critical breeding, feeding or watering habitat for populations that are utilized elsewhere
Cultural services	Abundance, rarity and beauty of species, habitats and landscapes	Providing opportunities for : • cultural activities and heritage • spiritual and religious activities and wellbeing • social interaction • recreational use and enjoyment • research and education

[5] Turpie J. 2009. Wetland valuation. Volume III: A tool for the assessment of the livelihood value of wetlands. TT 442/09. Water Research Commission, Pretoria. ISBN: 978-1-77005-934-4.

Chapter 3: Wetlands and well-being: a user's perspective

In this chapter, we present real-life examples, where, from a user perspective, wetlands contribute to (and occasionally impair) our collective and individual well-being. We have woven into our descriptions some of the key factors that allow us to achieve well-being, notably property rights and business.

Wetlands and agriculture: the Pongola floodplain

As has been mentioned often in this handbook, wetlands are regularly at the centre of agricultural production, particularly amongst rural subsistence farmers and small-scale commercial farmers. Activities might include crop cultivation and the grazing of livestock in and immediately around wetlands and the drawing of water for irrigation or for livestock watering outside the wetland.

In order to improve the various benefits that flow from these agricultural activities, farmers require extension support, training, access to inputs and finance and, obviously, access to markets. But, above all, they require secure rights of access to the land and water which are the foundations of production.

The Thonga people have lived on the Pongola River floodplain for thousands of years. Here they practised subsistence agriculture, grazed and watered their livestock and harvested fish for food. Their livelihood options were facilitated by regular flooding of the Pongola River which brought with it water, soil and nutrients. Through traditional allocation systems residents had secure rights to these resources. Their well-being was secure and they lived in relative harmony. In 1973 the Pongolapoort Dam was built, the flood regime was changed and the lives of the Thonga people changed fundamentally and forever. Residents were deprived of their rights to vital natural resources; social cohesion declined and conflict has dominated for the last twenty years.

On the Pongola River floodplain, residents have been systematically deprived of their rights to water resources (Henny Kok)

So, if this is what happens when we deprive people of their rights, what should we be doing to ensure that rights are secured and/or restored, and that people can secure additional benefits from wetland-based agriculture? Using the design principles for common property resources we might consider the following:

- **Boundaries:** Through the establishment of the dam and the control of flood releases, central government effectively changed the boundaries of the resource system and who had access to this system. For any system, if one is going to optimise the benefits, it is critically important to know what its key constituents are, what its boundaries are and who has (or should have) access.
- **Costs, benefits and risks:** Prior to the establishment of the dam, the benefits of engaging in agriculture on the floodplain exceeded the costs. After dam construction this was reversed. The risk and costs associated with agriculture increased significantly. So, it is important to ensure that when engaging in wetland and floodplain-based agriculture, the benefits exceed the costs and the risks are manageable.
- **Collective choice:** Before the dam was built, decisions were made communally by the users. After construction of the dam, decisions were made by central government, mostly without consultation. To ensure rights are secured, decisions about resource

allocation need to involve, and preferably be led by, the users of the resource, in this case the local farmers.

- **Monitoring:** Before dam construction, monitoring was vested with the users who adapted their farming activities to what they encountered. After dam construction, this was vested with government and the farmers were unable to adapt. Users need to be central to and accountable for monitoring so that they can adapt their practices to changing circumstances.
- **Sanctions (penalties):** Prior to the dam, rights to resources were recognised and respected. If someone broke the rules of use they were penalised. After dam construction, decisions were taken outside the customary system and it became increasingly difficult to exercise authority at the local level. Being able to sanction rule breakers at the local level – at the level of the user – is necessary for rights to be respected and maintained.
- **Conflict resolution:** Prior to dam construction, conflict resolution was handled at a local level. In the dam era conflict resolution involved government officials sitting in Pretoria. External influences began to dominate. Conflict resolution needs to take place at the local level amongst the various users.
- **Rights to organise:** Prior to the dam, rights to organise at a local level were recognised and encouraged. After its construction, dam rights were

negotiated outside of the traditional authority and locals were disempowered. They were unable to organise. Local organisation, of farmers in this case, is essential if benefits are to be optimised.

This example has focused on farmers, but rights to wetland resources extend beyond agriculture. As one example, at Papenkuils in the Western Cape, the right of the local residents to harvest waterblommetjies is exceedingly fragile. Technically, the activity requires permission and the harvesters are trespassing. If the rights were more secure, harvesters might invest more in the harvesting process and secure a better return.

Wetlands and craft: the Inina story

One way in which rural people, particularly rural women, can enter the economy, learn about business and improve their well-being is through the production and sale of craft. And it is not just about income. Crafting is often carried out as a group activity which reinforces social bonds, and many of the items produced have significant cultural relevance – it is a proud and enduring tradition.

The raw material of numerous craft products originates in wetlands. Ikhwane (*Cyperus latifolius*) and incema(*Juncus kraussi*) are two sedges that are typically used to produce a variety of woven products such as sleeping mats

(amakhanzi), food mats (izitebe) and more contemporary items such as conference bags and beach bags. Clay from wetlands is also used to manufacture traditional and contemporary ceramic pots (ukhamba). Though sedges might only be seasonally available and there might be shortages in some years, availability of this raw material is not usually a constraint. The challenges lie more with getting the product to market and securing a decent income from sales. So, for crafters to get 'more bang for their buck' from a wetland through craft production, the issues are much less about the wetland per se and much more about business skills and organisation.

A range of contemporary craft products are made from the fibre of wetland plants

The Inina Craft Agency (www.inina.co.za) is an appropriate example. Detailed lessons from this agency are contained in

documents 7 and 8 in the accompanying CD but here is an overview. While crafters have almost unlimited access to raw materials and so could easily boost their production, they are severely constrained by access to markets. They are far removed from these markets, many crafters are poorly educated, there are language issues and most understand very little about business. With this understanding, the Inina Craft Agency was established in Eshowe in northern KwaZulu-Natal in 2005. It is a primary trading cooperative whose members are crafters but whose management comprises skilled business people. The management team markets products, secures orders, passes on orders to producers, takes delivery of completed products, ensures quality, effects delivery to customers, and secures and makes payments. It is a complex process of linking producers to markets and it follows a conventional business model. The management team members are drawn from the craft group's leadership and have received intense business skills training and long-term mentoring. Inina is, in effect, a conventional business with local shareholding.

In many instances Inina management also deals with additional business complexity. As an example, if conference bags are being supplied to a conference where there are international delegates, these bags require fumigation and an accompanying certificate before they can enter other countries. Co-ordinating this requires considerable experience and expertise as does the direct exporting of some of these products. Also, to further improve crafters'

well-being, it is not sufficient just to increase the market for existing products. It is also necessary to design new products for existing markets and for new markets, and train producers in how to make them.

Inina provides an example of how supply or value chains need to extend from the raw material to the end-user for business to succeed, and how, if this happens, the scale of business can increase. With this business growth, more producers can secure more benefits from being part of the process. It is also an excellent example of how a women-owned and women-operated business has contributed considerably to the empowerment of women.

Wetlands and tourism: the Umngazi estuary

Tourism is a major contributor to South Africa's economy. In 2012, ten million foreign tourists entered the country contributing R76 billion, while domestic tourists contributed R21 billion. Tourism directly employs nearly 600 000 people and employment growth is about 30 000 jobs per annum, at a time when overall employment levels are declining. Some of our major tourism draw-cards are wetland-based. We have the iSimangiliso Wetland Park, a world heritage site containing both the Kosi and St Lucia lake systems; the Wilderness lakes system; Langebaan, and countless smaller sites. The opportunity for wetland-based tourism growth

and, with it, an increasing contribution to well-being, is considerable.

Umgazi River Bungalows creates over 200 direct and indirect jobs

But, in a tourism context, how does a wetland add value and contribute to improved well-being? Let's zoom in and analyse the Umngazi River estuary on the Eastern Cape Wild Coast. Located on its banks is Umngazi River Bungalows, an award-winning tourist resort catering for about 120 guests. Importantly, its location there is very much dependent on the estuary. Considering first the resort guests, the estuary provides opportunities for relaxation, birding, recreational fishing, boating, canoeing and skiing, all of which contribute to well-being. Then consider the staff of about 180, most of whom are drawn from nearby rural communities. The resort pays salaries and wages of nearly R1 million per month,

making it by far the largest business contributor to the local economy. Then, consider the local community directly. The infrastructure and services that have been established for the resort – road, water supply, electrification – also service these people. Finally, consider the micro-enterprises – the fishing guides, the canoe and horse trail operators, the life-savers – who are able to conduct business with the resort and its guests.

We can compare the Umngazi situation with what is, or rather what is not, occurring less than five kilometres away on the northern side of the Mngazana River estuary. The estuary, as a natural asset arguably, provides more in term of opportunities – it has over 100 hectares of almost pristine mangrove forest. However, here the local community cannot access finance, lack the business acumen to develop and operate a tourist resort, cannot readily access markets and have to contend with poor or non-existent infrastructure and services. In addition, the water supply to the area has not worked for three years and the access road is in a very poor state.

While an estuary is a key natural asset acting as a foundation for human well-being, actually realising its value requires business acumen and skills, investment, access to finance, access to markets, and the availability and maintenance of services and infrastructure. As in the previous craft example, it is about building business on the natural asset. In South Africa we have a plethora of wetland-based natural assets

that might anchor tourism enterprises. These are not the limiting factor; rather it is our ability to add value.

Wetlands and water security: the Umngeni River Basin and the Manalana Wetland

South Africa is not well endowed with easily and cheaply available water resources. The country is either dry or, where there is good rainfall, it is highly seasonal demanding large water-storage capacity. Water is available – if need be, we can desalinate – but it is the cost of securing it that impacts on our well-being. The more expensive the water, the less there is to spend on all the other things that make life worth living. So, if we can protect, enhance, create or rehabilitate those natural assets that are able to conserve and store water, then we are likely to be in a better position. If, at the same time, these natural assets purify the water flowing into them, that places us in an even better position.

Wetlands do this. They take up water, remove nitrates, phosphates, sediment and various other substances and release clean water back into the stream or river feeding them. As wetland specialists tell us, not all wetlands are equal – some wetlands do this well and others not so well. Some artificial systems do it exceptionally well, settling ponds at sewage works being a case in point.

Let us examine two examples where wetlands are contributing to, or have the potential to contribute to, improved water security and, with that, well-being. The first is the Umngeni River. Four and a half million people are literally cradled in this river basin and it supports the second largest economy in South Africa. Water security is critical for societal and individual well-being. The spotlight focuses on Midmar Dam, the largest and most important water storage facility in the system. The dam receives additional water from the Mooi River through an inter-basin transfer scheme so currently the quantity of water available is not of concern; however, the quality of the water entering the system is. A poorly operating sewage system serving a low cost housing development, combined with agricultural production upstream, are combining to elevate nitrate and phosphate levels.

Midmar Dam – some predict it will become eutrophic by 2028 (Duncan Hay)

Some scientists predict that at the current level of nitrate and phosphate accumulation the dam will become eutrophic in about 2028. Not only will this hugely increase the cost of water purification, but it will severely impair the dam's recreational value – the Midmar Mile, the largest timed swimming event in the world, takes place here.

A multi-organisational partnership has been established to tackle this and other river basin management issues. Plans are well advanced to upgrade the sewage system and to establish an artificial wetland downstream so as to filter any poor quality water that might escape and flow towards the dam. In the agricultural areas upstream, the plan is to rehabilitate those wetlands that have highest 'water purification' potential in combination with educational and awareness campaigns, and improved compliance monitoring.

A second example is the Manalana Wetland at Craigieburn Village in Mpumalanga. It was suggested that the degradation of the wetland was compromising livelihood opportunities, specifically with regard to water supply for domestic use, for livestock watering, for reed production and for cultivation. Rehabilitation of the wetland was completed in 2007 and an economic analysis of this intervention was conducted. It was estimated that if the wetland had not been rehabilitated, the benefits accruing to users would have declined by about 75%, which is highly significant. The research showed also that the impact of not rehabilitating would have been felt not just amongst the direct users but also further downstream. Most important was the wetland's

role as a ‘safety net’. Though villagers have access to piped water, the supply was highly erratic. When it failed they were able to obtain water from the wetland.

Wetlands and well-being: the downside

Not all attributes of wetlands have the potential to improve the well-being of users. Some attributes do the opposite; they impair our well-being. Wetlands are prime habitat for disease vectors such as the snail that carries bilharzia and malarial mosquitos. They are also habitat and/or roosting sites for crop pests such as the Red Billed Quelea, a bird that feeds on grain. However, it should be noted that some wetland plants also act as a trap-crop for pests that would otherwise occur on cultivated crops – they draw the pests away from cultivated crops. Because of their thick vegetation, wetlands provide good cover for criminals. This same thick vegetation also makes for a considerable fuel load and very intense fires which can affect surrounding non-wetland areas. Wetlands are often difficult to cross on foot and, because of the marshy conditions, it is expensive to establish infrastructure such as roads through their drainage lines. Finally, homes occurring at or near wetlands can be subjected to periodic flooding and persistent dampness.

There are numerous practical ways of reducing these impacts. For example, it has been demonstrated that if a wetland is maintained in a good ecological condition, its potential to facilitate the spread of disease is reduced. Also, it is a good idea to maintain a healthy buffer of natural

vegetation between a wetland and surrounding crops.
Finally, try to avoid directing infrastructure through wetlands and don’t build homes in areas at risk from flooding.

Chapter 4: Wetlands and well-being: a systems perspective

Some theory and concepts

When we imagine a wetland, we typically imagine what photographs depict – a broad expanse of reeds and sedges, some birds and wildlife and, perhaps, some livestock and a few cultivated plots. But the system, as a whole, is much more than that. It is the resource that we have just mentioned – the ecosystem, natural capital or, to use a more recently coined phrase, ecological infrastructure. But, it is also the resource users – people collecting water, harvesting reeds and medicinal plants, cultivating crops, grazing cattle, birding, carrying out research and conducting baptisms. In addition, it is those people who do not directly use the system themselves but who facilitate and regulate use by others – the individuals and organisations that make the rules, establish the customs and conventions, and provide the infrastructure - which influence how the system is used, governed and managed.

Then there are the actual rules – the practices, customs, conventions and laws which guide how we behave. Included in this is the knowledge held by users, governors, managers and researchers that help us make decisions about how we use the system. The people and our social system are termed our social infrastructure.

Then there is the physical infrastructure. It might be something as simple and basic as the path leading to a water source, a bucket used for collecting water or a hoe used in cultivation. It might be a sophisticated water reticulation system purifying and carrying water from the wetland to a rural village or hospital.

Finally, the system does not exist in isolation. It exists within a broader geographic landscape – surrounding grasslands and forests, upstream and downstream river systems. It also exists within a broader economic and social landscape – the sleeping mat produced with wetland fibres might end up hanging on the wall of a New York apartment.

Within all this are the various relationships – between the crafter, the reed harvester and the reeds; between the traditional leader and the reed harvesters; between the reed harvester and the truck driver taking the reeds to market; and between the crafter, the export agent and the New York client. We soon come to appreciate the complexity of the system.

In summary, we mobilise the combined natural, social and physical infrastructure of a wetland to supply us with material and psychological benefits that improve our well-being. These processes are, in turn, affected by the interactions of natural, social and physical infrastructure that occur in the broader landscape.

Two examples

Let us examine two illustrative examples from opposite ends of the country that occur in very different contexts: the Papenkuils Wetland at Worcester in the Western Cape, and the Mbongolwane Wetland in KwaZulu-Natal. Our interest in Papenkuils was piqued when we found residents of Worcester harvesting waterblommetjies and selling them on the side of the road. Our interest in Mbongolwane stems from resource-use research that has been conducted at the wetland.

The waterblommetjie harvesters of Papenkuils (Donovan Kotze)

Starting with Papenkuils, who are the users? They include wine farmers, livestock owners, waterblommetjie harvesters, downstream water abstracters, downstream recreational water users, Muslim pilgrims, the municipality and Eskom. What were they knowingly or unknowingly using the wetland

for? Activities include livestock grazing, harvesting waterblommetjies, viticulture, canoeing, carbon storage, water storage, groundwater recharge/ discharge, flood attenuation, nutrient assimilation, maintenance of biodiversity, and spiritual practices.

Who sets up and monitors the informal and formal rules of use of the system? They include the provincial Department of Agriculture, the provincial Department of Environment and Development Planning, Cape Nature, Breede Overberg Catchment Management Agency, Central Breede River Water Users Association, Holsloot Water Users Association, Breede Valley Municipality, Mondi Wetlands Programme, the World Wildlife Fund (WWF) and the Biodiversity in Wine Initiative.

What are the rules, conventions and knowledge that guide use? These include:

- Technical assistance in planning artificial drainage systems for wetlands;
- Advice on sustainable agricultural practices;
- Support for clearing of invasive alien plants;
- A Biodiversity Stewardship Agreement and the associated management plan (establishment, support, monitoring and evaluation);
- Implementation of the National Water Act regarding the allocation of water licences; determination of the reserve; protection of water resources in the water management area; implementation of the Catchment Management Strategy;

- Allocation and distribution of water to registered water users;
- Maintenance and management of the water resource;
- Management and control of fires;
- Support to Cape Nature and the Department of Agriculture for the sustainable management of the wetland;
- Support to the wine producers of the Biodiversity in Wine Initiative;
- Enforcement of the National Environmental Management Act;
- Input into planning for proposed future agricultural developments.

Then there is the physical infrastructure that facilitates access and use. Physical infrastructure includes road access, agricultural machinery, canoes, various public services and even the recycled bread bags that are used to package the waterblommetjies.

This broad understanding of the social-ecological system was used to explore ways in which the wetland could continue to provide direct income to local people, particularly to the poorest members of society. This led us to focus on the waterblommetjie harvesters. We found that income from this activity was higher than from casual agricultural labour, and that it made a significant contribution to the livelihoods of the collectors during a time of year when there are few

opportunities for casual labour. We also found that harvesting was technically illegal but there was no enforcement of the formal rules governing this. It pointed to the need to regularise the activity and so reduce the risk to harvesters.

Medicinal plant harvesting at Mbongolwane (Amy Panikowski)

Who are the users at Mbongolwane Wetland? The users are primarily residents living close to the wetland but also include the local hospital and, occasionally, reed and sedge harvesters who are not local.

How is the wetland being used? Direct use includes livestock grazing; cultivation of amadumbe; water abstraction for drinking, washing and stock/crop watering; harvesting of

reeds, sedges and medicinal plants; fishing, hunting and baptismal functions.

Who is regulating and/or mediating use? The rules of use are set up primarily by the traditional authority in consultation with users and also by various government departments working in the area. However, there are also a number of development agencies, corporate agricultural businesses and research institutions which are also mediating use.

The actual rules include, amongst others, traditional conventions, the Conservation of Agricultural Resources Act and the National Environmental Management Act. There are also various agricultural practices and protocols being followed, some introduced during extension support efforts over ten years ago.

The primary external impacts in the broader landscape and amongst the residents are, firstly, a large sugarcane expansion programme around the wetland. This is increasing income to many residents but is also constraining the space available for livestock grazing and food crop cultivation. The second is the social grant system which, as it is rolled out, appears to be reducing individual incentive to engage in other income-earning activities.

In the course of the research, we discovered that agricultural use of the wetland was declining as older people went out of production and there were few new recruits, and extension services had declined. In addition, small scale subsistence

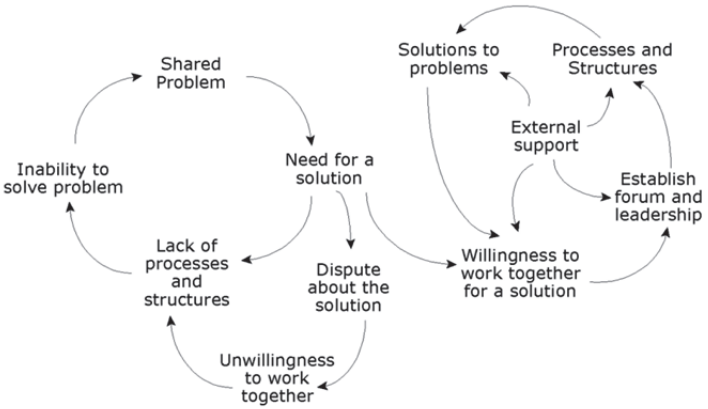
agriculture around the wetland was being replaced by larger group schemes, and the statutory regulations governing resource use were being largely ignored, both by the users and by the regulators.

The key issue that emerged at Mbongolwane is the lack of co-ordination and co-operation between various initiatives supporting local development. There are numerous initiatives that are not 'talking' to each other. This is affecting:

- property rights – access to certain resources such as grazing land is affected;
- land-use planning – land is being taken up by cash crops without consideration for food crops;
- extension support – local farmers are unsure whom to take advice from and whom to believe;
- social cohesion – local people are, occasionally, being manipulated to satisfy various agendas.

Chapter 5: How should we manage or support management?

As practitioners or action-researchers, or simply as individuals and groups going about our daily lives, we will all have encountered what is illustrated in the diagram below.



Solving problems generally requires a willingness to work together, the necessary structures and external support

At a wetland there will regularly be shared problems, often about resource use. There is a need for a solution but there are disputes about what the solution should be. People are unwilling to work together and/or there are a lack of processes and structures that allow people to work together. We are unable to solve the problem and end up back at

square one. Actually, we may end up worse off than when we started if distrust develops and relationships are eoded or destroyed.

In order to reverse this, there needs to be a willingness to work together, to establish support and to identify appropriate processes and structures. Solutions to problems are developed and implemented and positive relationships and trust are established making it much easier to solve the next set of issues. This process often needs external facilitation until the leadership is sufficiently confident to run it on its own.

Before proceeding, let us ask why external facilitation is required. After all, communities have been solving their own problems since the beginning of time. Firstly, external facilitation brings new knowledge (both technical and organisational) that is not necessarily available to local stakeholders. Secondly, the trade-offs are often contentious and a 'referee' is required. Thirdly, the individuals or groups involved in the problem often possess very different levels of power – a balancing act is required. This is the starting point for adaptive management.

Adaptive management

Adaptive management or strategic adaptive management (SAM) is a process of decision making used more and more in

natural resource management. It recognises that problems are complex and that there are high levels of uncertainty. There is a need for ongoing probing, testing and experimenting, supported by ongoing learning about the issues and the system.

Before detailing the process, there are several elements that are the foundation for, and central to, adaptive management:

- **Understanding and appreciating context:** Individuals differ; groups of people differ. Every wetland is unique; it has its own character. The landscape surrounding each wetland is unique. Understanding and appreciating this uniqueness allows one to adapt processes so that they are locally relevant.
- **Understanding one's role:** Make sure you understand your role when entering into the management process. Are you part of government; are you a facilitator; are you a researcher; do you make commercial or subsistence use of wetland resources? Understanding your role will clarify your own interest and, as a result, you will be less likely to confuse others. This is especially the case with facilitators who regularly engage with a conservation or developmental agenda. Remember, as a facilitator you are accountable for the integrity of the process as this brings integrity to the outcomes. But you are

not directly accountable for outcomes, the stakeholders are.

- **Complexity:** People are complex as are relationships between individuals and groups; natural systems are complex as are the relationships between natural systems and people; and the management process is complex. So what we are dealing with is profoundly complex, dynamic and with high levels of uncertainty. Embrace it, don't avoid it. Also, because of this complexity, the unexpected happens. Be in a position to respond to it.
- **Relationships and trust:** Central to an adaptive management process is establishing relationships and trust. Although this does not guarantee success, it facilitates improved collective decision making and action. Historically, this would have evolved over generations amongst a fairly homogenous group of users – the chief, cultivators, water collectors, stock grazers, hunters and medicinal plant collectors. The rules of the game would have been well understood – don't water your cattle where we are washing our clothes. Now we have less time to establish relationships and trust amongst a far more heterogeneous group of people – traditional leadership, democratic leadership, subsistence users, business people, water managers.
- **Inclusivity:** This is a collective learning process where all stakeholders' perceptions need to be aired, acknowledged and debated. If people are not

involved, they are unlikely to adopt solutions that are agreed to.

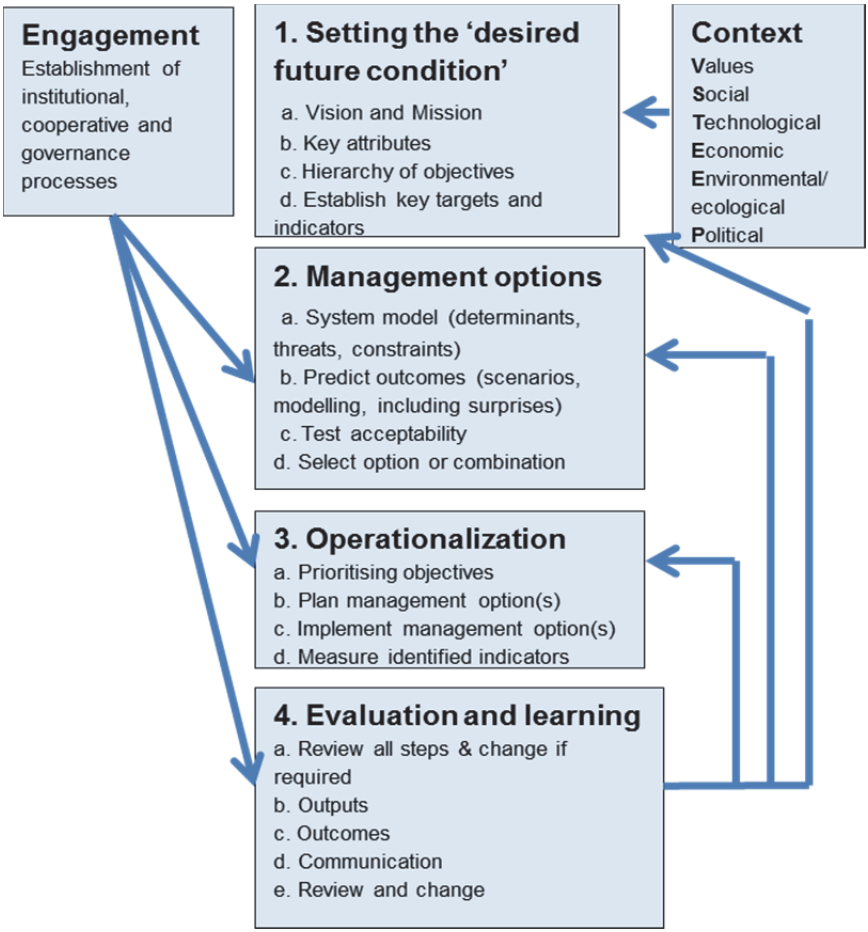
- **Knowledge:** Also central to the management process is creating a positive space where everyone learns from everyone else. Knowledge is power. Collectively generated knowledge has the effect of balancing out power differences and creating a more level playing field. Special emphasis needs to be placed on using knowledge to empower the powerless. Also, it is not just about our own knowledge; but about respect for the knowledge of others.
- **Small successes:** Adaptive management is a process of doing, reflecting on what one has done, learning from this and then refining. In doing this, start small and enjoy small obvious successes that can be shared. (Eat the elephant one mouthful at a time!). Practise and build.
- **Communicate, communicate, communicate:** A key to success is effective communication. This means communicating relevant information that is accessible and understandable, in a manner that is socially and culturally acceptable. Until fairly recently this was difficult amongst rural communities but now the cell-phone has revolutionised the way we do things and has fundamentally empowered rural people.
- **Look to the future:** Explore scenarios. Try and imagine what may lie ahead and what changes are likely to take place, and incorporate this into

management. For example, one might consider whether agricultural use of the wetland is increasing or decreasing – what is the trend and what might we do to influence it? Is the demand for wetland fibre-based craft increasing – should we think of encouraging people to plant wetland plants at their homesteads to supplement the supply of raw material?

- **Time:** Adaptive management of the relationship between people and natural resources is time consuming. It involves changes in behaviour which do not happen overnight. It involves powerless people reclaiming their authority. This takes decades and is the timeframe that we should be thinking about.

The general process is as follows (Figure 5.2):

1. How might a wetland improve our well-being?
2. What do we need to do to achieve this?
3. What management options do we have to realise our vision?
4. How do we make it work?
5. How do we know whether we are achieving our vision?



A generic strategic adaptive management framework (source Kingsford and Biggs 2012[6])

[6] Kingsford RT and Biggs HC. 2012. Strategic adaptive management guidelines for effective conservation of freshwater ecosystems in and around protected areas of the world. IUCN WCPA Freshwater Taskforce, Australian Wetlands and Rivers Centre, Sydney.

The catalyst for the process might be any wetland issue – a conflict about resource use or an intended development. However, simply solving the issue at hand is unlikely to be sufficient because, as we know, one issue is normally linked to another. We need to deal first with the whole system before we start plunging into the detail.

Participatory approaches

Adaptive management emphasises management being carried out as a participative process, but it does not engage in the detail of how we might achieve desired levels of participation and buy-in. There are a range of participatory processes that we might use. They include Participatory Rural Appraisal (PRA) which is a system and a set of methodologies that was developed in the 1980s and 90s that allows local people to learn together, to conduct their own analyses, to plan and to act. More recently it has been modified and refined into Participatory Learning and Action (PLA).

There are other systems that can be applied but they generally share the same foundations:

- **Empowerment** through the co-generation and sharing of knowledge, and the breaking of the 'monopoly' on information that is used for decision making;

- **Respect** for local expertise, experience and capabilities. Researchers and practitioners become the listeners;
- **Localization** – encourage visual sharing using *local* symbols, materials and representations, avoiding external representations;
- **Enjoyment** – PRA/PLA should be fun, with an emphasis as much on the process as on the outcome;
- **Inclusiveness** – inclusion in the process of marginalised and vulnerable people such as women, children, the aged and the very poor.

Facilitating participative processes involving adaptive management, PRA or PLA is demanding. It requires a high level of social skills – understanding how people are likely to behave, and technical skills – a good understanding of the subject area. It requires considerable experience and, with this, confidence. Participants need to be confident that they are being guided correctly, and they need to have confidence in and trust their guide. While there are numerous handbooks and manuals that can help you develop facilitation skills, formal training is usually required. If you are not formally trained and have limited experience, secure the services of someone who is and learn from them on the job.

What questions should we be asking?

In engaging in an adaptive management process with a particular focus on a wetland (or group of wetlands) as a source of well-being, what kinds of questions should we be asking?

Broad ecological and socio-economic context

- What is the topography?
- What is the geomorphology?
- What is the rainfall?
- How big is the wetland (biophysical)?
- What are the main vegetation types?
- What fauna occurs in and around the wetland?
- What is the socio-economic context?
    - Rural traditional
    - Affluent residential
    - Affluent rural
    - Urban informal
    - Urban, low cost formal
    - Industrial
    - Commercial agriculture and forestry
    - Private conservation
    - State conservation
- How transformed is the wetland? (ranging from pristine to completely transformed – it is no longer a wetland).

Direct use of water

- Are people drawing water directly from the wetland or its immediate feeder streams?
- Is the wetland their main source of water?
- Where else are they drawing water – standpipe, borehole, water tanker, rain harvesting?
- Are they washing clothes at the wetland?
- Are they bathing in the wetland?
- Is there a major off-take of water from the wetland (or upstream and downstream) for domestic, commercial, mining, industrial or social (school, clinic, hospital etc.) needs?
- What are the major trends in water use? As an example, are people making less direct use of water from the wetland and greater use of standpipes connected to a reticulation system?
- How important do the users think the wetland is as a source of water?

Farming (cultivation and livestock)

- Are people growing crops in the wetland?
- What crops are they growing and what is the extent?
- What crops are being grown around the wetland?
- Are farmers drawing water from the wetland to irrigate crops or water livestock away from the wetland?

- Of these crops, what proportion are sold on and what proportion are used directly by households?
- Is crop cultivation providing an opportunity for invasive alien plants to establish themselves in the wetland?
- Is livestock being grazed in the wetland and if so, what species (cattle, goats, sheep) and at what times of the year?
- Is livestock important to residents?
- How important do farmers think the wetland is for farming relative to the surrounding area?

What agricultural use is being made of a wetland? (Donovan Kotze)

Harvesting plants

- Are people harvesting reeds and sedges from the wetland?
- What are they being used for – thatch, craft, other utility items?
- Are the harvesters selling on most of what they collect or are they using it themselves?
- Where are the craft products being marketed and to whom? (What is the value chain?)
- Are medicinal plants being harvested? If so, what species, what are their uses and what are the financial returns? (What is the value chain?)
- How important is reed, sedge and medicinal plant harvesting to local people relative to harvesting similar resources outside the wetland?

What plants are being harvested and what are they being used for? (Department of Environmental Affairs)

Fishing and hunting

- Does fishing take place in the wetland or its immediate feeder rivers/streams?
- If so, what are the primary species being caught and how are they caught?
- Are the fish an important source of income or nutrition?
- If they are an important source of income, how are they processed and who are they sold on to?
- Does hunting take place in the wetland?

- If so, what species are hunted and how prevalent is it?
- Are the animals that are hunted an important source of income or nutrition?
- If they are an important source of income how are the animals processed and who are they sold on to?
- Overall, how important do the residents perceive harvesting, fishing and hunting to be?

Mining

- Is there mining activity at or immediately around the wetland?
- If so, what is being mined, what is its extent and who are the beneficiaries of the mining operation?
- What impact is the mining having on the wetland and its surrounds?

Tourism

- Are there any tourism facilities at or near the wetland and what are the primary wetland-related tourism activities?
- Who are the tourists?
- Are local residents obtaining jobs and deriving income from these tourism operations?
- How reliant are local residents on these tourism operations for income?

What tourism is taking place at the wetland? (Donovan Kotze)

Recreation, leisure, sport, culture and religion

- Is the wetland a location for religious and cultural ceremonies (such as baptisms), and for sport, recreational and leisure activities (such as canoeing, recreational fishing and birding)?
- If so, who are the primary user groups and how are they organised?

Conservation

- Is conservation the primary land use at or around the wetland?

- If so, what specifically is being conserved and why?
- Whose authority does it fall under and who are the conservation managers?

What conservation use is being made of the wetland? (Duncan Hay)

Rehabilitation

- Is rehabilitation of degraded areas of the wetland taking place?
- Are there sites of degradation where rehabilitation might be considered?
- How might rehabilitation improve the well-being of users (both directly and indirectly) and in what areas?

- What is the job creation potential of rehabilitation activities?
- What proportion of income accruing from rehabilitation will accrue locally and how long is the project likely to last?

Research, knowledge and learning

- What research is being conducted at the wetland?
- Who are the beneficiaries of this research?
- What teaching is happening at the wetland?
- Who are the teachers and who are the learners?
- Are the lessons from engaging at this wetland being transferred and used at other wetlands?

What research is taking place at the wetland? (Duncan Hay)

Mediators/regulators of use

- For each resource, who or what is regulating/or mediating its use? (What are the rules and conventions, and physical infrastructure?)
- Who is providing this infrastructure or service?
- Which government departments are involved and what roles are they playing?
- What traditional governance structures are in place and what is their influence?
- What NGOs and development agencies are involved and what roles are they playing?
- Are there obvious tensions between users and regulators/mediators of use and, if so, what are the sources of these tensions?

Impacts of use

- Are there any obvious ecological impacts of the various resource uses that have been identified, and are they or should they be a cause for concern?
- What impacts are a cause of concern for local residents?
- What steps are being taken to address the impacts?
- What impacts might be opportunities e.g. for Working for Wetlands?
- What are the main sources of tension amongst various users?
- What dominant trends are being observed by users?

External impacts

- What external processes/drivers are affecting what is occurring internally?
- What are the specific impacts?

Additional opportunities

- What are the opportunities for productive use that have not been taken up?
- Why have they not been taken up?
- What needs to be done to facilitate the take-up?
- What are the risks inherent in taking up the opportunity?

Chapter 6: The decision support system: a short summary

The technical decision support system is contained in the CD attached to the back cover of this handbook. It was developed by Donovan Kotze and, although it is complete, it will undergo further refinement with testing.

It builds on a WRC wetland management handbook: *Wet-Ecoservices: A technique for rapidly assessing ecosystem services supplied by wetlands*[7] and on a decision support system developed to support estuary-based economic empowerment[8]. It comprises an explanatory text and an excel-based series of spreadsheets which allows one (in a desk-top or participatory process) to:

1. Assess the supply of ecosystem services for a particular wetland or group of wetlands

[7] Kotze DC, Marneweck GC, Batchelor AL, Lindley DS and Collins NB. 2007. *WET-EcoServices: A technique for rapidly assessing ecosystem services supplied by wetlands.* WRC Report No TT 339/08, Water Research Commission, Pretoria.

[8] Bowd R, Breen C, Hay D, Kotze D and Mander M. 2012. An approach to estuary-based economic empowerment with a particular focus on the Eastern Cape Wild Coast. WRC Report No 1705/1/11. Water Research Commission, Pretoria.

2. Explore how different use scenarios might affect the suite of ecosystem services supplied by a wetland
3. Assess the current demand and use of the services
4. Identify opportunities for and the risks to the supply of ecosystem services
5. Assess the costs (dis-benefits) of the wetland, e.g. habitat for disease vectors
6. Identify opportunities for increasing the benefits and addressing risks/threats to the ecosystem services
7. Identify means of addressing the costs.

Chapter 7: Conclusion

"Water is the new gold" Unknown

While the future is unknown and unknowable there are some things of which we can be fairly certain. We can be fairly certain that our water resources and specifically our wetlands will come under increasing pressure. There will be more people wanting more water so that they can survive and prosper. We can't live without water and we cannot establish our well-being and livelihoods without it. If we want our wetlands to continue to perform for us and deliver the benefits that we require then we need to increasingly appreciate the relationship that exists between ourselves and wetlands. We cannot separate ourselves from wetlands and other natural resources; we are as one.

It is difficult to appreciate the nature of this relationship if we don't understand it. Understanding and appreciation comes from increasing our individual and collective knowledge. While knowledge, in itself, does not guarantee an increased appreciation it certainly increases the chances.

That is what this modest contribution has attempted; to increase our knowledge of, and with it, our appreciation of wetlands as contributors to our well-being. And if we are smart, this contribution can increase significantly.

While the focus here has been on freshwater wetlands, much of what has been written applies equally to other types of wetland systems – rivers, lakes, estuaries, coasts – and to terrestrial habitats such as grasslands and forests. Also, all these systems are connected to each other and to us. It is critical that, in all that we do, we consider the whole system – a social-ecological system of people and nature.

Appendix 1: What information is available and where can I find it?

In researching this handbook it became apparent that there is a considerable body of information available on the subject, and that it would be very difficult to do it justice and package it all into a single and simple guide. As an alternative, and to retain the information's integrity, we have included a range of material on a CD inside the back cover. The information contained on the CD is either in the public domain or we have secured permission from the copyright holders. There are two key publications that are not in the public domain and are not on the CD. However, they can be obtained through normal commercial sources as explained.

What follows is a summary of this information. It includes authors and titles for each, a source (other than the CD) and briefly summarises content and, where appropriate, application. Please note that this is not a critique of these documents. Nor is it exhaustive. We have not included journal articles aimed at researchers and academics. Our bias has been to source information that would be useful primarily to practitioners, policy makers, development agencies and conservation agencies. We have attempted to include everything we consider important but inevitably we will have left out documents and so will have offended some people – we apologise!

A specific guide to the information follows. Each document is numbered for easy referencing:

- General information on theme, concepts and frameworks – 2, 9
- Global views of the relationship between natural resources and well-being – 14, 17, 18
- Practical guidelines on wetlands and well-being – 20, 21
- Practical guidelines on wetland management – 3, 4, 5
- Practical guidelines on natural resource-based businesses – 7, 8
- Policy guidelines on wetlands and well-being – 10
- Scientific texts on wetlands and well-being – 1, 6, 12, 13, 15, 16, 20, 22
- Engagement processes and guidelines – 11
- Rural development research – 18

1. **Bowd R, Breen C, Hay D, Kotze D and Mander M. 2012. An approach to estuary-based economic empowerment with a particular focus on the Eastern Cape Wild Coast. WRC Report No 1705/1/11. Water Research Commission, Pretoria.**

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=9714&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dAn+Approach+to+Estuary-

Based+Economic+Empowerment+with+a+Particular+Focus+on+the+Eastern+Cape+Wild+Coast+%26start%3d1

This report is aimed at both researchers and practitioners. The report is about the final project in the Eastern Cape Estuaries Management Programme (ECEMP), which started in 1998. It had become apparent that disadvantaged people living near estuaries were continually marginalised in the economic development process. This project aimed to address this issue. Research assessed the state of, and opportunities for, economic empowerment in the estuaries of the Wild Coast. A methodology for assessing economic empowerment opportunities was developed and tested in three situations, and these case studies are discussed. Key findings for the case studies are that: (i) Significant opportunities for establishing estuary- and wetland-based enterprises exist; (ii) Stakeholder response to the methodology was positive; (iii) Participants were able to engage the process effectively; (iv) The methodology could be applied in proactive and responsive planning and management contexts; (v) The methodology is transferable to other common property resource systems. The excel-based toolkit, as it was applied to estuaries and modified for application to freshwater wetlands, is included on the CD. Note that the toolkit requires an experienced resource economist and facilitator as 'driver'.

2. **Breen C (Editor). 2013. Community-based natural resource management in southern Africa: An introduction. Authorhouse. ISBN: 978-1-48175764-5 (e)**

http://bookstore.authorhouse.com/Products/SKU-000652814/CommunityBased-Natural-Resource-Management-in-Southern-Africa.aspx (This publication is not on the CD but is available for download at a cost of $US 1.99 from this URL.)

This recently completed textbook on community-based natural resource management is primarily an undergraduate teaching tool but would also be useful to conservation and development practitioners. It contains the conceptual and theoretical foundations that one would require to engage the subject area of wetlands and well-being. Most useful reading would include:

- Chapter 4: Economic Foundations of CBNRM;
- Chapter 5: Well-being, livelihoods, business, and CBNRM;
- Chapter 6: Roles of institutions and governance in CBNRM;
- Chapter 8: Role of adaptive management in CBNRM.

It also contains a specific case study (Case study 2) that is wetland-based.

3. **Chiuta T and Mharapara I. 2009. Best practice guidelines for the management of inland wetlands in southern Africa. FAO.** (Draft – not available online).

This guideline report is designed for wetland management practitioners and facilitators. It follows a livelihoods and ecosystem integrity approach to the management of wetlands in southern Africa. This is informed by the principles of community-based natural resource management. It provides specific guidance on working with communities and details essential aspects of community participation. Following this it provides guidance on how use of the wetland might be allocated and what the criteria for monitoring this are. Within this context it provides specific guidelines on wetland cultivation and cropping, livestock grazing, fisheries operations and harvesting of wetland products. It concludes with brief guidance on wetland rehabilitation.

4. **Chuma E and many others. Undated. Guideline for sustainable wetland management and utilization: key cornerstones.**

http://cgspace.cgiar.org/bitstream/handle/10568/21756/Chuma%20et%20al%20Guideline%20for%20Sustainable%20Wetland%20Management%20-%20key%20cornerstones.pdf?sequence=1

This guide is aimed at wetland management practitioners and facilitators. It outlines an approach to the sustainable utilisation and management of wetlands with a special focus on their contribution to livelihoods. It is based on general experience and specific observations at three case studies in the Limpopo basin. It presents a very useful conceptual framework for sustainable wetland management incorporating eight cornerstones:

1. Sound understanding of the ecology and socio-economic situation of the wetland by communities and outsiders;
2. A community-based monitoring and evaluation system which enables all to learn, and to adapt from successes and failures;
3. Management functions which balance ecosystem functions and human needs.
4. Incentives which encourage the maintenance of ecosystem services;
5. Facilitation of land users/communities which ensures inclusive, consensus-based planning and management processes;
6. The legal frameworks developed by different actors must be coherent and encourage sustainable use of wetlands;
7. Negotiated local rules and by-laws which discourage unsustainable use of wetlands;

8. Agreed upon and functional institutional arrangements which facilitate and regulate sustainable wetland utilisation and conservation.

For each of these cornerstones, the guide tabulates the major elements and the key strategies and processes required to address the major elements. It also suggests possible ways to implement the strategies and processes.

5. Dada R, Kotze D, Ellery W and Uys M. 2007. WET-Roadmap: A guide to the Wetland Management Series. WRC TT 321/07. Water Research Commission, Pretoria.

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=9106&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dWET-RoadMap%26start%3d1

This guide is aimed at wetland management and rehabilitation practitioners. It provides an introduction to the WET-Management tools and includes a brief outline of the documents and tools in the WET-Management series and how they inter-relate. The guide has an index which includes reference to specific sections in the relevant tools.

The tools include WET-Origins; WET-Management Review; WET-Roadmap; WET-RehabPlan; WET-Prioritise; WET-Legal; WET-Ecoservices; WET-Health; WET-EffectiveManage; WET-RehabMethods, and WET-RehabEvaluate.

6. **Hay D and many others. In preparation. Wetlands and well-being. WRC Report . Water Research Commission, Pretoria.**

http://www.wrc.org.za/pages/KnowledgeHub.aspx

This report is aimed primarily at researchers but acts as one of the foundations of this guide. It provides a social and historical context for wetlands and well-being, explores a number of frameworks and models that might assist in analyses and outlines the key attributes required of a decision support system. It follows this with six geographic or thematic case studies:

- Mbongolwane – An ongoing analysis of wetland-based natural resource use at the Mbongolwane Wetland in northern KwaZulu-Natal;
- The Governance of Craigieburn – A meta-reflection on the governance of the Craigieburn Wetland in Mpumalanga;
- The Waterblommetjies of Papenkuils – A social-ecological systems analysis of the Papenkuils Wetland in the Western Cape;
- Property Rights, Ecosystem Services and Water Resources – An introduction to property rights and water resources with a focus on wetland and floodplain examples;
- Mpenjati Estuary - Connecting supply and demand: a process for stakeholder learning about trade-offs in social-ecological systems;

- Mondi, Wetlands and Well-being – A social-ecological systems analysis of Mondi's approach to wetlands and livelihoods.

7. **Hay D. 2008. The business of craft and crafting the business: lessons for success in the rural craft sector. Published by the Centre for Environment, Agriculture and Development at the University of KwaZulu-Natal.**

http://www.tcd.ufl.edu/Data/Sites/44/media/documents/tropilunch/2011/BusinesofCraftHandbook-lowresolution.PDF

8. **Hay D, McKenzie M and Thompson G. 2010. Bankable craft: putting money in people's pockets. University of KwaZulu-Natal and Environdev. ISBN 978-0-620-49005-4**

http://plusnetwork.files.wordpress.com/2011/01/bankable-craft.pdf

These two handbooks are aimed at development and small business support practitioners. While they focus on craft, the generic nature of the guides allows them to be used in a broad micro-enterprise development context. Together they cover: an overview of the South African craft sector; the business of rural craft; leadership; establishing an enabling external environment; marketing and sales; product development and production systems; financial and general

management and administration; scale and differentiation; infrastructure and technology; monitoring and evaluation; risk management; communication, and innovation.

9. **Hay D, Nkhata B, Wilkinson M, Harris K, Breen C and Crafford J. 2013. Linking property rights, ecosystem services and water resources: an introduction. WRC Report No TT 554/13. Water Research Commission. Pretoria.**

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=10298&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dLinking+Property+Rights%2c+Ecosystem+Services+and+Water+Resources%26start%3d1

This handbook provides a practical guide to the key concepts of property rights and ecosystem services as they are applied to water resources. It includes both the international and South African experience of applying these concepts, and it links them to the South Africa's constitution and legal system.

10. **IWMI. 2006. Working wetlands: a new approach to balancing agricultural development with environmental protection. International Water Management Institute Water Policy Briefing, Issue 21.**

http://www.iwmi.cgiar.org/publications/briefs/water-policy-briefs/iwmi-water-policy-briefing-21/

This policy briefing document is aimed at policy makers, practitioners and researchers. It introduces wetlands as a source of human well-being and outlines a useful and fairly simple process to determine the 'Working Wetland Potential':

1. Classify current ecological condition of the wetland
2. Classify current wetland contribution to social welfare
3. From (1) and (2) above determine the development pressure for the wetland
4. Determine suitability of the wetland for a specific agricultural activity based on (a) biophysical suitability and (b) socio-economic suitability
5. Identify the hazard potential of a specific agricultural activity based on possible impact on (a) ecological condition and (b) social welfare
6. Combine suitability and hazard potential (4 and 5 above) to classify the Working Wetland Potential.

Without going into detail it describes ways of establishing (1) to (6) above.

11. **Kingsford RT and Biggs HC. 2012. Strategic adaptive management guidelines for effective conservation of freshwater ecosystems in and around protected areas of the world. IUCN WCPA Freshwater Taskforce, Australian Wetlands and Rivers Centre, Sydney. ISBN 978-0-7334-3061-9**

http://www.wetrivers.unsw.edu.au/wp-content/uploads/2012/05/Strategic-Adaptive-Management_2012.pdf

This guide is aimed at researchers, policy makers and practitioners. It presents the 'state-of-the-art' in management processes for natural resources, particularly freshwater resources. It defines Strategic Adaptive Management (SAM) and explains how to implement the framework. It then provides detail on the implementation steps: Step 1. Setting the desired future ecological condition; Step 2. Management options; Step 3. Operationalisation; Step 4 Evaluation and learning.

12. **Malan H (Series Editor). Various Dates. Wetland health and importance research programme. Water Research Commission, Pretoria.**

http://www.wrc.org.za/pages/KnowledgeHub.aspx

These research publications are aimed primarily at researchers and academics. They are broadly aimed at

assessing wetland environmental condition and socio-economic importance. There are a number of volumes that are pertinent to various aspects of wetlands and well-being. They include:

- Turpie J, Lannas K, Scovronick N and Louw A. 2010. Wetland valuation. Vol I: Wetland ecosystem services and their valuation: a review of current understanding and practice.
- Turpie J (Editor). 2010. Wetland valuation. Vol II: Wetland valuation case studies.
- Turpie J. 2010. Wetland valuation. Vol III: A tool for the assessment of the livelihood value of wetlands (described in more detail under No 20).
- Turpie J and Kleynhans M. 2010. Wetland valuation. Vol IV: A protocol for the quantification and valuation of wetland ecosystem services.
- Kotze D. 2010. WET-Sustainable Use: A system for assessing the sustainability of wetland use.
- Kotze D, Malan H, Ellery W, Samuels I and Saul L. 2010. Assessment of the environmental condition, ecosystem service provision and sustainability of use of two wetlands in the Kamiesberg uplands.

13. **McCartney M, Rebelo L-M, Senaratna Sellamuttu S and de Silva S. 2010. Wetlands, agriculture and poverty reduction. Colombo, Sri Lanka: International Water Management Institute. (IWMI Research Report 137). doi: 10.5337/2010.230**

http://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/PUB137/RR137.pdf

This research report is aimed at practitioners, policy makers and researchers. In its discussion it summarises the general findings of research:

- Wetland ecosystem services provide a wide variety of tangible and intangible benefits to large numbers of people in Africa and Asia. The way they do so is complex and multifunctional and is directly related to the type of wetland and its condition at a particular given time.
- Wetland agriculture, which can be viewed as a provisioning ecosystem service, provides a development opportunity and a poverty reduction strategy for many poor people, but care is needed to ensure that other ecosystem services, including other means of food security (such as fisheries) which are also vital for poor people, are not lost.
- Astute management that incorporates appropriate water and agricultural practices within wetlands and their surrounding catchments, can result in a net increase in the benefits derived from wetlands.

- Wetlands can be considered natural hydraulic infrastructure, bestowing many water resource benefits, and these need to be carefully considered in the planning and management of wetlands.

14. Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: wetlands and water synthesis. World Resources Institute, Washington, DC.

http://www.unep.org/maweb/documents/document.358.aspx.pdf

This report provides a global overview of the relationship between human well-being and wetlands. It emphasises and expands on the key research lessons outlined in Chapter 2 of this handbook.

15. Pollard S, du Toit D, Cousins T, Kotze D, Riddell E, Davis C, Adey S , Chuma E and Mkhabela B. 2009. Sustainability indicators in communal wetlands and their catchments. Lessons from Craigieburn Wetland, Mpumalanga. WRC Report No K5/1709. Water Research Commission, Pretoria.

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=8719&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dSustainability+indicators+in+communal+wetlands+and+their+catchments+Lessons+from+Craigieburn+wetland%2c+Mpumalanga%26start%3d1

This report is aimed at both researchers and practitioners. It covers both the biophysical and social/governance realms. It is a useful reference when thinking about the question: how do we know, going into the future, whether the contribution of the wetland to well-being is being sustained? It provides several sub-sets of indicators which might be used for monitoring attainment of this goal. It was specifically developed for a single case-study wetland. However the approach and several of the indicators are likely to have wide application, particularly for wetlands under communal tenure which are cultivated.

16. **Pollard S and Cousins T. 2008. Community-based governance of freshwater resources in southern Africa. WRC Report TT 328/08. Water Research Commission, Pretoria.**

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=3690&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dCommunity-based+governance+of+freshwater+resources+in+Southern+Africa%26start%3d1

This report, aimed primarily at researchers and policy makers, explores issues of natural resource management of wetlands in communal areas. It sets out the institutional confusion brought about by multiple legal systems – customary and statutory – technically described as legal pluralism. The report develops a conceptual framework for case-study analysis and uses this framework to review community governance of water resources in South Africa, Mozambique, Zimbabwe and Zambia. It concludes by suggesting appropriate governance arrangements for water resource management in communal areas of South Africa.

17. **Russi D, ten Brink P, Farmer A, Badura T, Coates D, Förster J, Kumar R and Davidson N. 2013. The economics of ecosystems and biodiversity for water and wetlands (final consultation draft). The Institute for European Environmental Policy (IEEP), London and Brussels. Ramsar Secretariat, Gland.**

http://www.ramsar.org/pdf/TEEB/TEEB_Water-Wetlands_Final-Consultation-Draft.pdf

This report is aimed at policy makers, practitioners and researchers. It takes a global perspective and outlines the value and benefits associated with water and wetlands; the role of wetlands in terms of providing water and wetland-related ecosystem services, and their value; the wider set of ecosystem services that water and wetlands provide and

their value; what needs to be done to improve consideration of the value and benefits of water and wetlands in policy development and in practical decision making; what approaches have been successfully used to date to respond to the challenges and take account of the value of water and wetlands; what existing examples demonstrate in terms of how policy, investment and water and land use decisions can be based on the value and benefits associated with water and wetlands, and what the recommendations are for transforming regional, national and international approaches for managing water, wetlands and their ecosystem services.

18. **ten Brink P, Mazza L, Badura T, Kettunen M and Withana S. 2012. Nature and its role in the transition to a green economy. United Nations Environment Programme.**

http://www.teebweb.org/wp-content/uploads/2012/10/Green-Economy-Report.pdf

This report is aimed at policy makers, researchers and practitioners. It presents, through a global perspective, the argument that natural resources underpin our economy, and are essential to deliver well-being and protect against poverty. It also explains how we might transition from our currently unsustainable 'brown' economy to a sustainable 'green' economy.

19. **Tshintsha Amakhaya. 2012. The agrarian rural household economy: status report on livelihoods, rights, and land use in selected sites in Kwazulu-Natal, Limpopo, the Eastern Cape, and Western Cape. Executive Summary. Tshintsha Amakhaya.**

https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnx0c2hpbnRzaGFpbnRyYW5ldHxneDo2MDA1OWI1Nzg4MTQwNzQ0

This report is essential reading for development policy makers, practitioners and researchers in South Africa. It presents the findings of a baseline survey focusing on the agrarian rural household economy. The survey covered 7 000 household members in 1 743 households in 12 local municipalities in four provinces. Key findings include the following:

- The majority of households live below the poverty line;
- One in four members in a household identified themselves as farmers but only 2% earned their main income from farming;
- Hunger is prevalent among rural households;
- Food is procured primarily from supermarkets and is not procured locally;
- Farming is constrained by access to land;
- Where land is limited, people invest in livestock;
- Households draw water from rivers, streams or dams to water their crops and livestock;

- People on church land are least organised, followed by farm workers/dwellers;
- Farm evictions contribute significantly to growth in informal settlements.

20. Turpie J. 2009. Wetland valuation. Volume III: A tool for the assessment of the livelihood value of wetlands. TT 442/09. Water Research Commission, Pretoria. ISBN: 978-1-77005-934-4.

http://www.wrc.org.za/Pages/DisplayItem.aspx?ItemID=8664&FromURL=%2fPages%2fKH_AdvancedSearch.aspx%3fdt%3d%26ms%3d%26d%3dWetland+valuation.+vol+III+-+a+tool+for+the+assessment+of+the+livelihood+value+of+wetlands%26start%3d1

This report forms part of the wetland health and importance research programme which is supported by the Water Research Commission. It is aimed at researchers and practitioners. It describes how communities benefit from wetlands, the factors affecting the provisioning value of wetlands, and how one might assess dependence on wetlands and their livelihood value. It follows this with a detailed description of the Wetland Livelihood Value Index and the assessment process. The steps in this process are:

1. Define objectives and level of study
2. Define study area boundary and wetland community
3. Describe habitats and provision of services

4. Score benefits derived from the wetland(s)
5. Assess vulnerability of local community
6. Assess current level of dependence on wetland(s)
7. Calculate the Wetland Livelihood Value Index
8. Assess sustainability of the community–wetland relationship

It is envisaged that the assessment will be performed by an expert. (There is no mention of its potential use in a participatory planning context but it is likely to have value here.)

21. Wetlands International. 2009. Planting trees to eat fish: field experiences in wetlands and poverty reduction. Wetlands International.

http://www.wetlands.org/LinkClick.aspx?fileticket=9UjRTWaCmoI%3D&tabid=56

This enigmatically titled book is aimed at both practitioners and researchers. It presents and records the experiences of four demonstration projects conducted in Kenya, Zambia/Malawi, Mali and Indonesia. It also briefly presents lessons from seven cases from South America, Asia and Africa analysing the information based on these questions:

- Can wetlands be managed sustainably and contribute to poverty reduction?

- What factors influence a wetland's ability to reduce poverty?
- Is poverty a cause or result of wetland degradation?
- If people depend on wetlands, will they use them sustainably?
- Why integrate sustainable use with poverty reduction?

The book then covers six themes which cut across the overall experiences of the demonstration projects and the seven additional cases:

- Poverty and livelihoods
- Biodiversity and ecosystem services
- Water management
- Engaging communities
- Policy
- Project management.

22. Wood A, Dixon A and McCartney M (Editors). 2013. Wetland management and sustainable livelihoods in Africa. Earthscan (from Routledge). ISBN13: 978-0-203-12869-5 (ebk)

http://www.routledge.com/books/details/9781849714129/

This book is aimed primarily at researchers and academics but would be useful to practitioners seeking an in-depth understanding of the relationships that exist between

livelihoods and wetlands. Its focus is largely on the agricultural use of wetlands. In the book it is argued that a paradigm shift is required from considering agriculture as a threat to wetlands to one that appreciates that wetlands play a fundamental role in sustaining the livelihoods of rural poor people. In Chapter 1, a framework for 'people-centred wetland management' is proposed. The essential elements of this framework include:

- People operating in a framework of society, politics and various economic, social and cultural incentives;
- People's contributions are reflected in the institutions and co-ordinated management, economic and socio-cultural incentives, as well as policy;
- The critical interaction is how people and wetlands interact. This is influenced by both socio-economic and environmental aspects with their different characteristics;
- The nature of this interaction determines the outcomes in terms of ecological, economic and institutional sustainability.

Chapters 2–10 comprise papers by leading wetland researchers in Africa. The final chapter outlines some common themes emerging from these chapters:

- Wetland agriculture makes a significant contribution to the livelihoods of rural, resource-poor people;
- The pressure on wetlands is increasing;

- Some wetlands are more resilient than others and trade-offs are required to ensure wetlands continue to deliver ecosystem services on a sustainable basis;
- Local knowledge and local institutions are key to effective management;
- Government policy, particularly related to land tenure, can be a major driver of pressure on wetlands;
- The policy process still tends to be top-down with wetland communities continuing to be excluded from policy debates.

It concludes by proposing:

- The adoption of a socio-ecological systemic approach;
- A reflexive and learning approach to adaptive wetland management;
- Improving our understanding of and incentives for people's wetlands use;
- Improving our understanding of required trade-offs;
- Empowering local institutional arrangements for wetland management;
- Influencing the policy debates on wetland use;
- Demonstrations of evolving best practice.